

2016 UNDERWATER BRIDGE INSPECTION REPORT



BRIDGE # L8542 MUN 10 over LITTLE FORK RIVER

DISTRICT: District 1

COUNTY: St. Louis

CITY/TOWNSHIP: Cook

STATE: Minnesota

Date of Inspection: 06/22/2016

Equipment Used:

Owner: City or Municipal Highway Agency

Inspected By: Janulis, Lukas

Report Written By: Lukas Janulis

Report Reviewed By:

Final Report Date:



TABLE OF CONTENTS

	PAGE NUMBER
UNDERWATER SUMMARY	3
UNDERWATER INSPECTION	5
UNDERWATER INSPECTION PROCEDURES	7
STRUCTURE INVENTORY	8
ELEMENTS	9
PHOTOGRAPHS	13
BRIDGE L8542 UNDERWATER INSPECTION DRAWINGS 2016	20

UNDERWATER INSPECTION

REPORT SUMMARY

The substructure units inspected below water at Structure No. L8542, the North and South Abutments and Bent 1, were found to be in poor to serious condition with moderate to at times heavy decay of the timber members. The timber of the piles and cross-bracing was at times decayed, but generally sound exhibiting random splitting or checking up to 1/4 inch wide and 1 inch deep. Several piles at the North Abutment and at Bent 1 exhibited more advanced timber decay and deterioration. The cross-brace on the north face of Bent 1 was broken just east of Pile D and not connected to Pile E. The timber pile cap at the North and South Abutments was partially bearing on the piles, and exhibited moderate to at times advanced decay/deterioration. The timber backwall often exhibited excessive sagging and visible gaps, but no notable loss of backfill material was observed. A light to moderate accumulation of timber debris was observed between Bent 1 and the North Abutment.

INSPECTION FINDINGS

(A) The channel bottom material typically consisted of rocks, gravel and silt with a maximum probe rod penetration of 2 inches. Random debris was scattered throughout the channel.

(B) The timber piles typically exhibited external decay from the channel bottom to 1 foot above the waterline. The timber typically allowed an awl penetration of 1/4 inch and a maximum penetration of 1/2 inch. From 1 foot above the waterline to the top of the piles, the timber was sound with random splitting or checking up to 3/8 inch wide and 1 inch deep.

(C) Heavier timber deterioration and decay, allowing a maximum awl penetration of 1 inch, was observed on the west side of Piles A, B and E of Bent 1 and Piles A and B of the North Abutment. The area of deterioration and decay typically extended from the channel bottom to 1 foot above the waterline.

(D) The timber pile cap of the South Abutment was bearing on the southern 25 to 50 percent of Piles A, B, C, F, G, H, I and J.

(E) The timber cross-bracing was typically sound with random splitting at the connections up to 1/2 inch wide.

(F) A 1 inch gap was observed in the 2"x4" backwall boards at approximately 4 feet above the waterline extending from Pile H to Pile F of the South Abutment. No significant loss of backfill was observed.

(G) A slight rotation towards the channel was observed at the southeast wingwall. The wall showed no signs of structural inadequacy.

(H) A light to moderate accumulation of timber debris consisting of 1 foot diameter and smaller logs and branches was observed extending from Bent 1 to the South Abutment at the upstream half of the channel and along all of Bent 1. The debris extended from the channel bottom to 4 feet above the waterline. Random steel and old tire debris was scattered throughout the timber debris.

(I) Timber pile cap of the North Abutment was not fully bearing on the southern 25 to 50 percent of Piles F, G, H, and I.

(J) A 1/2-inch wide split in Pile H of the North Abutment extended from the top of the pile down 2 feet with 6 inches of penetration.

RECOMMENDATIONS

(A) The timber debris accumulations between the South Abutment and Bent 1 and throughout the channel is partially obstructing the channel flow and consideration should be given to remove the debris in order to limit further debris accumulation, and reduce the likelihood of channel bottom degradation resulting from obstructed flow.

(B) Monitor the timber of the piles with noted heavier deterioration and decay and consider level III testing (core sampling) to verify interior soundness.

(C) Monitor inclination of the southeast wingwall rotation.

(D) Repair/replace the pile caps at the North and South Abutments and establish full bearing to the timber piles.

(E) The inspection of the submerged substructure units of Structure No. L8542 can most likely be accomplished in the future without using a dive team. To perform the underwater inspection, a properly equipped qualified inspector will have to enter the water during a period of low flow. As channel bottom contours and depths of flow can change quickly, it is recommended that lead line soundings of water depth be taken along the upstream and downstream fascias to determine whether wading is possible prior to beginning the inspection. If conditions are unsafe for inspection by wading, then an underwater inspection with the use of a dive team will be required.

(F) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

Contractor: Collins Engineers, Inc.

Contractor Job Number: 9687

UNDERWATER INSPECTION

1. BRIDGE DATA

Bridge #: L8542
Feature Intersected: LITTLE FORK RIVER
Facility Carried: MUN 10
District: District 1
County: 069 - St. Louis

Bridge Description:

The superstructure consists of a timber deck supported by steel beams. The superstructure is supported by two timber abutments and one timber pile bent.

2. INSPECTION DATA

Professional Engineer/Team Leader: Lukas Janulis
Inspection Diver: Lukas Janulis
Date of Underwater Inspection: 06/22/2016
Weather Conditions: Sunny, 70°F
Underwater Visibility (feet): 1.0 foot
Waterway Velocity (ft/sec): Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure(s) Inspected: The North and South Abutments and Bent 1.

General Shape:

The North and South Abutments and Bent 1 each consist of eight to ten 12 inch diameter timber piles labeled A through H from west to east with a 12 inch by 12 inch timber pile cap. Bent 1 has six diagonal 3 inch by 12 inch cross-bracing boards.

Maximum Water Depth at Substructure(s) Inspected (feet): 2.1 feet

4. WATERLINE DATUM

Water Level Reference: The top of the pile cap at the upstream end of Bent 1.
Waterline Elevation (feet): 93.9 feet
Description: The waterline was approximately 6.1 feet below the reference.

5. NBIS CODING INFORMATION

(Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code: 3
Item 61: Channel and Channel Protection: Code: 5
Item 62: Culvert: Code:
Item 92B: Underwater Inspection: Code: Y 48 06/16

Item 113: Scour Critical Bridge:

Code: I

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

Yes No (Mark your selection with an X)

6. STRUCTURAL ELEMENT CONDITION RATING

ELEM #	Element Description	Quantity	Unit	Conditions			
				CS1	CS2	CS3	CS4
216	Timber Abutment	132	LF			120	12
228	Timber Piling	42	EA		15	16	11
235	Timber Pier Cap	135	LF			125	10
884	Substructure Settlement & Mvmt	1	EA		1		
885	Scour	1	EA	1			

UNDERWATER INSPECTION

INSPECTION PROCEDURES

The routine underwater inspection of Bridge L8542 (MUN Route 10 over Little Fork River) was completed on June 22, 2016. The underwater inspection was conducted from shore. The inspection was conducted by a team consisting of a Professional Engineer Diver with a valid MnDOT Team Leader certification, a backup diver and dive tender. Due to waterway conditions at the time of the inspection, the inspection could be accomplished by wading in accordance with OSHA regulations. Channel bottom profiles were taken along the upstream and downstream faces of the bridge and around the periphery of substructure units to determine the presence, location, and area of scour.

The bridge elements inspected consisted of the two timber abutments and a timber pile bent pier. According to the bridge inventory, the North and South Abutments and Bent 1 are founded on timber piles supporting a timber cap. Inspection procedures followed FHWA guidance and the MnDOT Bridge and Structure Inspection Program Manual with channel bottom probing to search for foundations. The maximum routine underwater inspection frequency is recommended to remain at 60 months based on those findings and risk factors. Also, inspection procedures should continue to follow the above approach and standard guidance with 100% Level I and 10% Level II intensity efforts.

MINNESOTA BRIDGE INSPECTION REPORT

12/23/2016

Inspector: CO Bridge

BRIDGE L8542 MUN 10 OVER LITTLE FORK RIVER

County: St. Louis	Location: 0.1 MI N OF JCT CSAH 25	Length: 58.0 ft.
City: Cook	Route: 10 - MUN 10 Ref. Pt.: 000+00.040	Deck Width: 28.0 ft.
Township:	Control Section:	Rdwy. Area/ Pct. Unsnd: 1389 sq. ft. / %
Section: 18 Township: 062N Range: 18W Maint. Area:		Paint Area/ Pct. Unsnd: sq. ft. / %
Span Type: 3 - Steel 2	Local Agency Bridge Nbr.: 747	Culvert: N/A
List:		Postings: 24 40 40

NBI Deck: 6 Super: 4 Sub: 3 Chan: 5 Culv: N
 Open, Posted, Closed: P - Posted for Load
 MN Scour Code: I - LOW RISK

Appraisal Ratings - Approach: 7	Waterway: 8	Unofficial Structurally Deficient	Y
Required Bridge Signs - Load Posting: 2 - Vehicle & Semi (Type R12-5)	Traffic: 1 - Speed Limit	Unofficial Functionally Obsolete	N
Horizontal: 1 - Object Markers	Vertical: N - Not Applicable	Unofficial Sufficiency Rating	22.2

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
31	Timber Deck	Underwater	12/13/2016	1624 SF	0	1624	0	0
		Routine	06/28/2016	1624 SF	0	1624	0	0
Notes: [2016] Some wood preservative washing off of timber deck from deck leakage.								
510 - Wearing Surfaces		Underwater	12/13/2016	1389 SF	1350	39	0	0
		Routine	06/28/2016	1389 SF	1350	39	0	0
Notes: [2016] Cracks in bituminous up to 0.5", cracks are unsealed. [2015] Diagonal .25" cracks that are spaced 5' or less. [2014-2013] Minor cracking in bit. wear surface. No pot holes present. No decay, cracking, or crushing of timber deck.								
107	Steel Open Girder/Beam	Underwater	12/13/2016	581 LF	0	180	361	40
		Routine	06/28/2016	581 LF	0	180	361	40
Notes: [2016] Flaking rust with section loss from 1/8" to 3/16" on beam ends and up to 1/8" at mid span of beams. [2015] Flaking rust with some section loss present on half of the beams. [2014-2013] Significant section loss to most beams right at abutments. Bottom flange original thickness of 0.03'. Some bottom flanges measured 0.01'-0.02'. at abutments. All paint has failed with all lengths of beams having surface rust or section loss. 10 lines of beams S.S. from abut to pier. Thick rust along most stringers on lower flanges. Web rust at abuts.								
515 - Steel Protective Coating		Underwater	12/13/2016	2323 SF	0	0	0	2323
		Routine	06/28/2016	2323 SF	0	0	0	2323
Notes: [2016] Paint has failed throughout beams and diaphragms. Corrosion and flaking rust throughout.								
216	Timber Abutment	Underwater	12/13/2016	132 LF	0	0	120	12
		Routine	06/28/2016	132 LF	0	0	120	12
Notes: [2016] Added 40 LF to abutment quantity to account for wingwalls. East half of south abutment west end is crushing above pile 6A. 0.5" wide split on bottom of east half of south abutment cap west with extensive decay. [2015] Abutment movement causing caps to rotate. 4' long split in west end of east half of south cap with decay. Reduced pile bearing area due to cap rotation. [2014] North abutment bowed in middle. [2013] Abutments are slightly out of alignment. Pile C1 has extensive decay and shows crushing. Other piles have moderate shell decay. Fakopp results show micro second readings from 307-1524 indicating moderate to severe decay and/or splits in piles. Wings leaning out, piles starting to rot. Timber retaining wall on NW and SE corners. 1 pile not bearing E end S abut needs replacing. 1- E abut pile cracking								

BRIDGE L8542 MUN 10 OVER LITTLE FORK RIVER

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
228	Timber Pile	Underwater	12/13/2016	42 EA	0	15	16	11
		Routine	06/28/2016	27 EA	0	17	7	3
<p>Notes: [2016 U/W] Several piles at the North and South Abutments were partially bearing along the timber pile cap. [2016-2013] Pile C1 has extensive decay and shows crushing. Other piles have moderate shell decay. Fakopp results show micro second readings from 307-1524 indicating moderate to severe decay and/or splits in piles. See attached PDF Fakopp report. Piles are failing Appear to be rotting Abuts. & Piers. 1 pile not bearing E end S abut needs replacing. 2 other pile cracking, 1- E pier, 1- E abut.</p>								
235	Timber Pier Cap	Underwater	12/13/2016	135 LF	0	0	125	10
		Routine	06/28/2016	135 LF	0	0	125	10
<p>Notes: [2016] East half of south abutment west end is crushing above pile 6A. 0.5" wide split on bottom of east half of south abutment cap west with extensive decay. Horizontal checks in pier cap with a width of 1/8" and depth of 1.5" to 2". [2015] North and south abutment caps have some rotation. 4' long split in west end of east half of south abutment cap with decay. Pier cap on east end has extensive decay first 3'. West half of pier cap is hollowing and may be starting to crush. Wood above splits extending out past wood below splits. [2014-2013] All caps have minor weathering of splits and checks. N. abut. cap tipping New cap in 1995. Starting to rot.</p>								
313	Fixed Bearing	Underwater	12/13/2016	30 EA	0	10	20	0
		Routine	06/28/2016	30 EA	0	10	20	0
<p>Notes: [2016] Bearings rusting away at abutments. [2015] All bearings have flaking rust with section loss. [2014-2013] All bearings are rusted.</p>								
330	Metal Bridge Railing	Underwater	12/13/2016	116 LF	0	116	0	0
		Routine	06/28/2016	116 LF	0	116	0	0
<p>Notes: [2016] Dents and scrapes throughout rail. Surface corrosion on bottom rail and posts wear paint has failed. [2015] Paint has failed on w-beam and angle iron between posts. Surface corrosion on angle iron and some on posts. [2014-2013] Timber guardrail on NW and SE corners, rotting. Flex Beam w/ Angle Iron Posts.</p>								
515	Steel Protective Coating	Underwater	12/13/2016	401 SF	0	0	232	169
		Routine	06/28/2016	401 SF	0	0	232	169
<p>Notes: [2016] Paint failing on w-beam exposing galvanizing. Paint failing on all rail posts and angle rail west side with exposed steel having surface corrosion.</p>								
800	Critical Deficiencies or Safety Hazards	Underwater	12/13/2016	1 EA	1	0	0	0
		Routine	06/28/2016	1 EA	1	0	0	0
<p>Notes: [2016-2013] No critical deficiencies or safety hazard found during this inspection.</p>								
822	Bituminous Approach Roadway	Underwater	12/13/2016	2 EA	0	2	0	0
		Routine	06/28/2016	2 EA	0	2	0	0
<p>Notes: [2016-2015] Minor settlement along ends of deck. Traffic impact has not been increased. [2014-2013] Minor cracking</p>								
855	Secondary Members (Superstructure)	Underwater	12/13/2016	1 EA	0	0	0	1
		Routine	06/28/2016	1 EA	0	0	0	1
<p>Notes: [2016] Angle iron cross bracing mid span, over the pier, and at abutment. Corrosion and flaking rust throughout. Some cross bracing at abutments has rusted through at connection with beams.</p>								
881	Steel Section Loss	Underwater	12/13/2016	1 EA	0	0	0	1
		Routine	06/28/2016	1 EA	0	0	0	1
<p>Notes: [2016] 1/8" to 3/16" of section loss in bottom flange at abutments and 1/8" of the bottom flange mid span. Angle iron end diaphragms have up to 100% section loss at connection with beams. [2015-2013] BA at S. abut has 1/3 remaining bottom flange thickness (0.03' original now 0.01') Bottom flange thickness's measure from 0.01' to 0.025' at bearing areas.</p>								

BRIDGE L8542 MUN 10 OVER LITTLE FORK RIVER

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
884	Substructure Settlement & Movement	Underwater	12/13/2016	1 EA	0	1	0	0
		Routine	06/28/2016	1 EA	0	1	0	0
Notes: [2016-2016 Update] North and south abutment piling have pushed in causing abutment caps to rotate. Abutment backing wall boards above piling are tilted away from the river. Movement is causing caps to loose bearing on piling (up to 0.25" gap on river edge of caps). [2015] South abutment has some movement. [2014] North abutment moving.								
890	Load Posting or Vertical Clearance Signing	Underwater	12/13/2016	1 EA	1	0	0	0
		Routine	06/28/2016	1 EA	1	0	0	0
Notes: [2016] Load posting signs have no notable deterioration and match 2013 load rating. [2015-2013] Load rated and posted for 12-22-22.								
891	Other Bridge Signing	Underwater	12/13/2016	1 EA	0	0	1	0
		Routine	06/28/2016	1 EA	0	0	1	0
Notes: [2016] Most signs blocked by vegetation. SE delineator bent. [2015] Speed limit sign fading and peeling. [2014] NE delineator bent and missing bolt. Delineators. Bridge Speed Limit 20 mph.								
892	Slopes & Slope Protection	Underwater	12/13/2016	1 EA	0	1	0	0
		Routine	06/28/2016	1 EA	0	1	0	0
Notes: [2016-2015] No riprap present. No slopes in front of abutments. Backing boards have not been undermined. Minor erosion along wing slopes. [2014-2013] Rocky river bottom and riprap in place.								
894	Deck & Approach Drainage	Underwater	12/13/2016	1 EA	0	0	0	1
		Routine	06/28/2016	1 EA	0	0	0	1
Notes: [2016-2015] Drainage along east curb blocked by bituminous. [2014-2013] Roadway drainage has slightly eroded wing slopes.								
895	Sidewalk, Curb, & Median	Underwater	12/13/2016	1 EA	0	1	0	0
		Routine	06/28/2016	1 EA	0	1	0	0
Notes: [2016] Sidewalk timber has moderate weathering with splits and checks. [2015-2014] Hole in South ramp. [2013] No deterioration. Timber sidewalk on West side of bridge.								
900	Protected Species	Underwater	12/13/2016	1 EA	0	1	0	0
		Routine	06/28/2016	1 EA	0	1	0	0
Notes: [2016] Swallow nest present on underside of bridge.								

General Notes: SLC District 3
 Inspected by: [2016] CG, JB : [2015] CG, TM : [2014] BH, CG : [2013] BH, JDO.
 [2016 Update] Update inspection to correct deficient settlement element note.
 [2014 Update] Update inspection to upload date stamped photo of load rating.
 [2014] Inspected 6-30-14, water too high to see all elements well, returned to inspect 9-15-14. BH
 [2013] Fakopp used on timber piles.

58. Deck NBI: [2016] Some wood preservative washing off of timber deck from deck leakage. Cracks in bituminous up to 0.5".
 [2015] Diagonal .25" cracks that are spaced 5' or less.
 [2014-2013] Minor cracking in bit. wear surface. No pot holes present. No decay, cracking, or crushing of timber deck.

36A. Brdg Railings NBI: W-beam w/ Angle Iron Posts.

36B. Transitions NBI: Roadway does not meet minimum requirements. Timber retaining walls only have timber pedestrian rail to stop vehicles that leave the roadway.

36C. Appr Guardrail NBI: Roadway does not meet minimum requirements. Timber retaining walls only have timber pedestrian rail to stop vehicles that leave the roadway.

36D. Appr Guardrail Terminal NBI: Roadway does not meet minimum requirements. Timber retaining walls only have timber pedestrian rail to stop vehicles that leave the roadway.

59. Superstructure NBI: [2016] Flaking rust with section loss from 1/8" to 3/16" on beam ends and up to 1/8" at mid span of beams.

BRIDGE L8542 MUN 10 OVER LITTLE FORK RIVER

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
60.	Substructure NBI:							
61.	Channel NBI:							
62.	Culvert NBI:							
71.	Waterway Adeq NBI:							
72.	Appr Roadway Alignment NBI:							
	Inventory Notes:							

Inspector's Signature

Reviewer's Signature

Pictures



Photo 1 - Upstream Fascia, Looking Northwest



Photo 2 - Downstream Fascia, Looking Southeast

Pictures



Photo 3 - South Abutment, Looking Southwest



Photo 4 - Bent 1, Looking Northeast

Pictures



Photo 5 - North Abutment, Looking Northeast



Photo 6 - Deflected/Sagging Backwall Boards and Penetration at Southeast Wingwall, Looking South

Pictures



Photo 7 - Deformation of the Southeast Wingwall, Looking Southeast



Photo 8 - Loss of Bearing on Timber Pile at South Abutment Pile H, Looking South

Pictures



Photo 9 - Gap in Backwall and Sagging Boards at South Abutment, Looking South



Photo 10 - Timber Decay at Bent 1 Pile A, Looking North

Pictures



Photo 11 - Typical Split in Bracing Connections, Looking South



Photo 12 - Timber Pile Decay (North Abutment Pile B Shown), Looking North

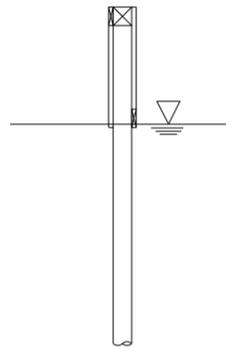
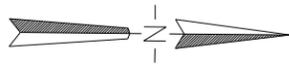
Pictures



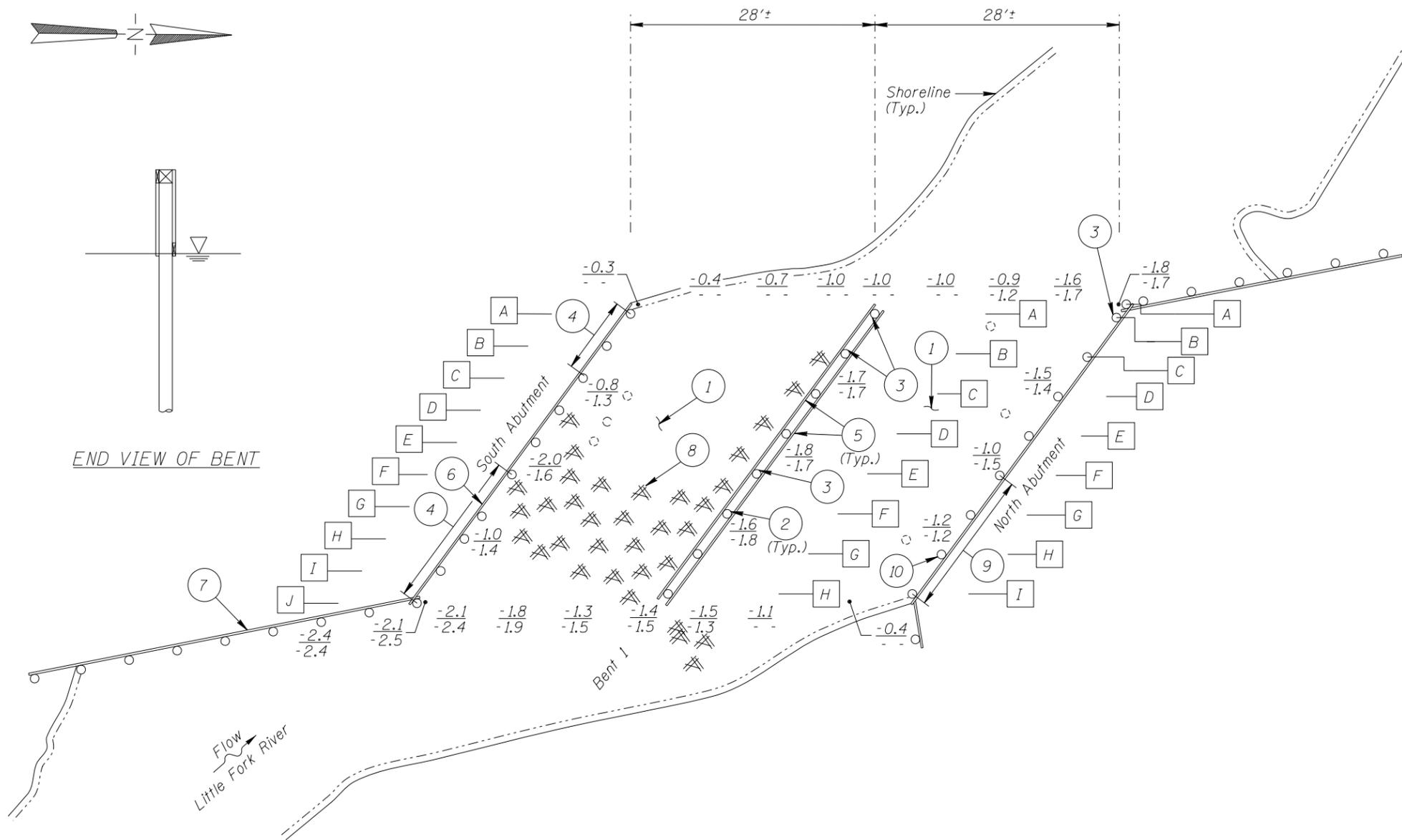
Photo 13 - Displacement of Backwall Boards at North Abutment, Looking Northeast



Photo 14 - Split in Pile H of North Abutment, Looking Northwest



END VIEW OF BENT



SOUNDING PLAN

INSPECTION NOTES:

- 1 The channel bottom material typically consisted of rocks, gravel and silt allowing a maximum probe rod penetration of 2 inches. Random debris was scattered throughout the channel.
- 2 The timber piles typically exhibited external decay from the channel bottom to 2 feet above the waterline. The timber typically allowed an awl penetration of 1/4 inch and a maximum penetration of 1/2 inch. From 2 feet above the waterline to the top of the piles, the timber was sound with random splitting or checking up to 3/8 inch wide and 1 inch deep.
- 3 Heavier timber deterioration and decay, allowing a maximum awl penetration of 1 1/4 inch, was observed on the west side and south sides of Piles A, B and E of Bent 1 and Piles A and B of the North Abutment. The area of deterioration and decay typically extended from the channel bottom to 2 feet above the waterline.
- 4 Timber pile cap of the South Abutment was partially bearing on the southern 25 to 50% of Piles A, B, C, F, G, H, I and J.
- 5 The timber cross-bracing was typically sound with random splitting at the connections up to 1/2 inch wide.
- 6 A 1 inch gap was observed in the 2"x4" backwall boards at approximately 3 feet above the waterline extending from Pile H to Pile F of the South Abutment. No significant loss of backfill was observed. In this area backwall boards were sagging 2 to 4 inches.
- 7 A slight rotation towards the channel was observed at the southeast wingwall. Apart from the deflection, the wall showed no signs of structural inadequacy.
- 8 A light to moderate accumulation of timber debris consisting of 1 foot diameter and smaller logs and branches was observed extending from Bent 1 to the South Abutment as shown. The debris extended from the channel bottom to 4 feet above the waterline. Random steel and old tires debris was scattered throughout the timber debris.
- 9 Timber pile cap of the North Abutment was not fully bearing on the southern 25 to 50% of Piles F, G, H and I.
- 10 A 1/2-inch wide split in Pile H of the North Abutment extended from the top of the pile down 2 feet with 6 inches of penetration.

GENERAL NOTES:

1. The North and South Abutments and Bent 1 were inspected underwater.
2. At the time of inspection on June 22, 2016, the waterline was located approximately 6.1 feet below the top of the pile cap at the upstream end of Bent 1. Since elevation information was not available, a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 93.9.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.

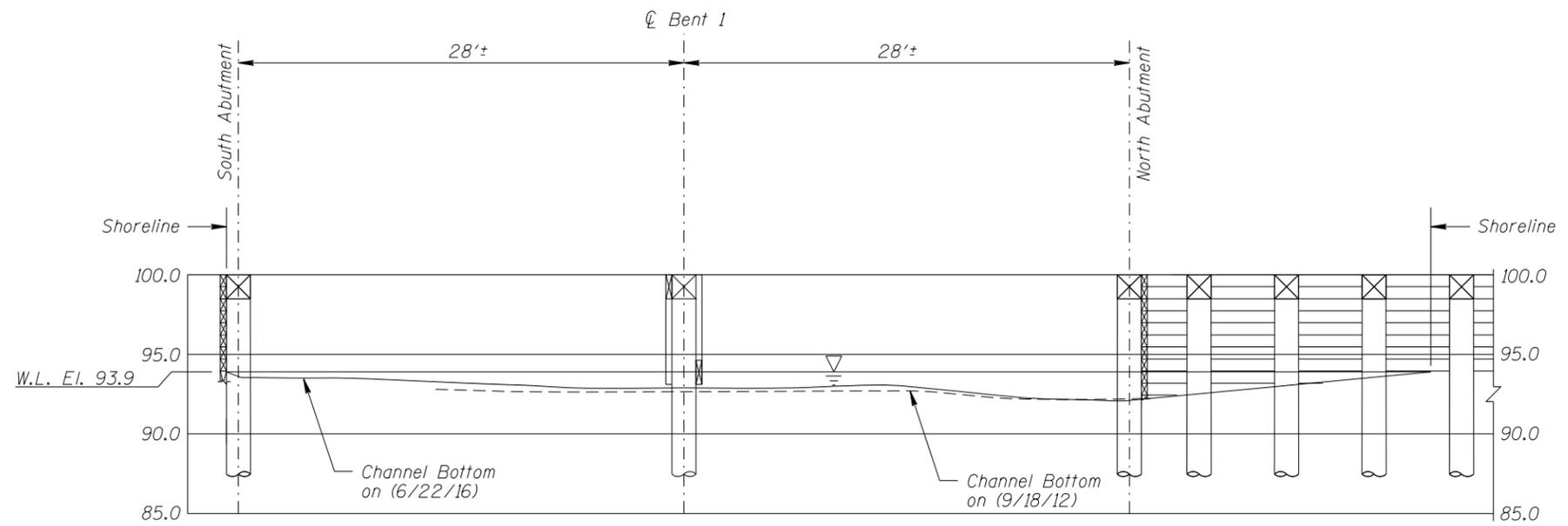
Legend

- 2.1 Sounding Depth from Waterline (6/22/16)
- 2.0 Sounding Depth from Waterline (9/18/12)
- A Pile Identification Designation
- 12"φ Timber Pile
- 12"φ Abandoned Timber Pile
- ⌘ Timber Debris

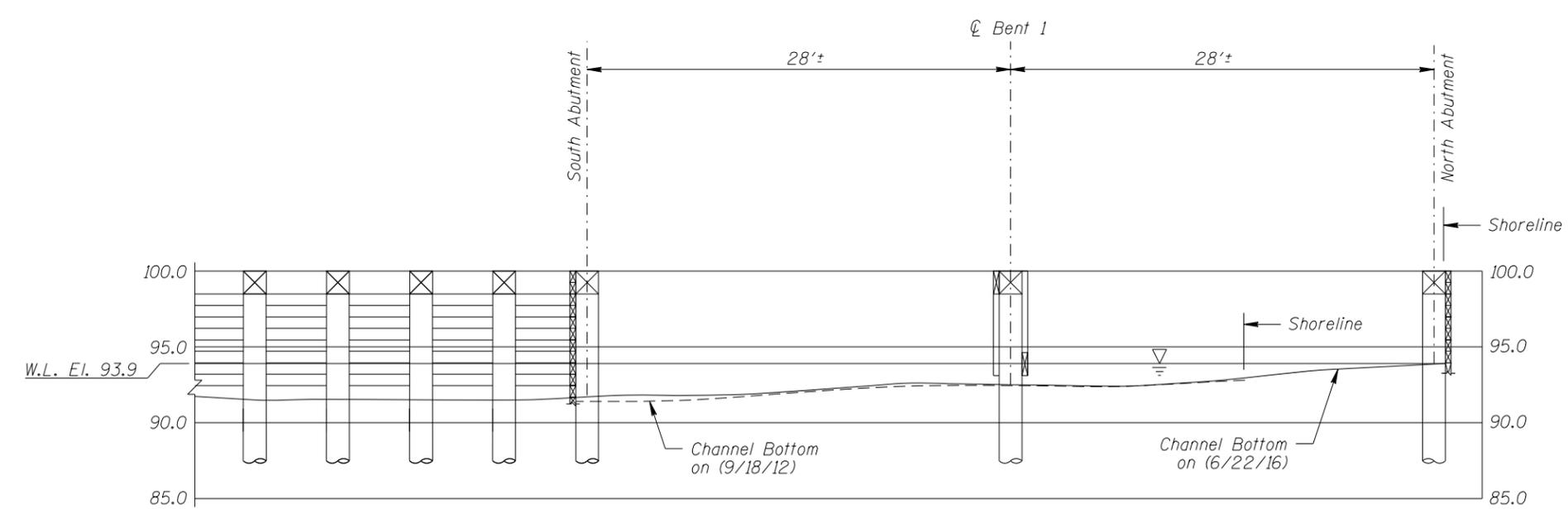
Note:

All soundings are based on 2016 waterline location.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. L8542 MUN 10 OVER LITTLE FORK RIVER DISTRICT 1, ST. LOUIS COUNTY		
INSPECTION AND SOUNDING PLAN		
DRAWN BY: PRH	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	DATE: JUNE 22, 2016
CHECKED BY: LJ		SCALE: NTS
CODE: 968793454		FIGURE NO.: 1



DOWNSTREAM FASCIA PROFILE



UPSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. L8542 MUN 10 OVER LITTLE FORK RIVER DISTRICT 1, ST. LOUIS COUNTY UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
DRAWN BY: PRH	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	DATE: JUNE 22, 2016
CHECKED BY: LJ		SCALE: 1"=10'-0"
CODE: 968793454		FIGURE NO.: 2